Extracts of the reports of these examiners are read by the president on the prize day.

What we have stated above quite supports Lord Kelvin's expression of disappointment at the reply vouchsafed to the deputation.

It appears also, from Lord George Hamilton's reply, that he does not consider the men of science employed at Coopers Hill to be servants of the Crown, and that consequently a different measure is to be meted out to them than that proper to the unscientific clerks in a department of the India Office. He is reported to have said that the age limit of the professors at the College is sixty; surely, under the Superannuation Act of 1859, it is sixty-five, and the professor may continue in office until seventy if the president certifies that the work is being efficiently performed.

Under the same Act, if it were desired to reórganise the College, there was a regulated way open which, beyond all question, would be the one employed in any reorganisation of the India Office itself; and surely under these circumstances it was the duty of the representatives of science to ask for simple justice. Chap. VII. of the Superannuation Act runs as follows:—

"It shall be lawful for the Commissioners of the Treasury to grant to any person retiring or removed from the public service in consequence of the abolition of his office, or for the purpose of facilitating improvements in the organisation of the department to which he belongs, by which greater efficiency and economy can be effected, such special annual allowance by way of compensation as on a full consideration of the circumstances of the case may seem to the said Commissioners to be a reasonable and just compensation for the loss of office; and if the compensation shall exceed the amount to which such person would have been entitled under the scale of superannuation provided by this Act *if ten years were added to the number of years which he may have actually served*, such allowance shall be granted by special minute, stating the special grounds for granting such allowance, which minute shall be laid before Parliament, and no such allowance shall exceed two-thirds of the salary and emoluments of the office."

Another point that the noble lord appears to have omitted to answer is Prof. Johnstone-Stoney's contention that the dismissals were not even in accordance with the terms of appointment.

If the above assertions are true, and we have every reason to believe that they are, is it surprising that the dismissed members of the staff should ask for further nquiry? And it is only natural that others, as represented by the signatories of the memorial presented on Tuesday week, should wish to support their application. It would appear that the inquiry is even more urgently needed since we have heard Lord George Hamilton's reply.

But the condition of the staff at Coopers Hill is only a small part of a large question, and the memorialists are quite justified in saying that "such dismissals are likely to affect adversely the cause of scientific teaching in the United Kingdom." An action of this kind by a Government department will not tend to raise the dignity of scientific teaching in the eyes of the general public, and unless England is to fall far behind other countries it is essential that due regard be paid to those fundamental subjects of science on which the welfare of the whole community depends.

All interested in English education, and we may add that their number now includes the more intelligent of our manufacturers, know full well that the rapid strides now being made by American and German engineers are due to a gradual perfecting of the welding of science to practice. In America, a four years' course, including both the science and art of engineering, is the rule in the engineering colleges. The engineering department of the University of Birmingham starts with a four years' course in which those subjects which have been summarily and, as we hold, unwisely, ejected from the Coopers Hill curriculum will hold a large place.

Lord George Hamilton now knows what the representatives of English science think of the proposals for which he is responsible. The opinion of the professional electrical engineers of this country will be gathered from the following comments upon the case, which appeared in last week's *Electrician*:—"The crucial question, therefore, is whether the proposed changes will enable the College to turn out better engineers. What, then, are these changes? They involve the abolition of the chairs of physics, chemistry, hydraulic engineering and mechanism, the assistant professorship of engineering, the lectureship in accounts, the demonstratorships in the mechanical laboratory and in physics, and the instructorship in electrical engineering. The selection is amazing! What sort of engineering college training can it be that can dispense with a teacher for any one of these subjects? And, considering that the supply of telegraph engineers has been one of the chief features of the College, how are we to regard patiently the abolition of the professorship of physics and the instructorship in electrical engineering? This is economy false to the core—so palpably absurd, indeed, that we doubt if economy is the real reason for these startling changes. Lord George Hamilton stated that in the revised curriculum 'electricity would be thoroughly taught,' as Sir William Preece had advised them that 'a demonstrator was capable of giving all the necessary instruction.' We entirely dissent from this view; with the rapid increase in the engineering applications of electricity, not less but *far more* instruction in electrical and allied subjects becomes increasingly necessary in any engineering college."

Of one thing we may rest assured. When the Indian engineers only know chemistry "to the extent required to enable the engineer to interpret results given by professional chemists," as quoted from the official documents by Lord Kelvin; and physics and electrical science as imparted by Sir William Preece's "demonstrator"; the reputation of a noble service, which has during the last quarter of a century achieved such admirable results, will soon be a thing of the past.

NOTES.

WE have received the following circular relative to the dismissals at Coopers Hill College. "In consequence of the unsatisfactory nature of Lord George Hamilton's reply to the deputation which waited upon him on Tuesday, February 12, to present the memorial relating to the dismissals at Coopers Hill, it has become necessary to take action in Parliament. It would be of great service if the signatories to the memorial would draw the attention of their local Member of Parliament to the action of the Secretary of State for India, and ask him to interest himself in the matter when it comes before the House. A copy of the memorial will be forwarded to any signatory on application to The Secretary, The Museums, Cambridge."

AN abstract of an interim report on yellow fever, by Dr. Durham and the late Dr. Myers, has been received by the Liverpool School of Tropical Medicine. The abstract mentions that a small bacillus has been found in the internal organs of those dead of yellow fever. From the fact that this bacillus has been found constantly and in apparently "pure cultures," it is concluded that there is good reason to suppose it to be the cause of the disease, but at the same time the need of more experimental work to establish the claim is recognised. Careful search was made for parasites of the nature of protozoa, but the observers conclude that yellow fever is not caused by that class of parasite.

IN connection with the subject of the foregoing note, it is of melancholy interest to refer to articles in the *Jornal do Commercio* of Para, on the subject of the death of Dr. W. Myers and of the illness of his colleague, Dr. H. Durham, who both contracted yellow fever in the pursuit of their dangerous duties whilst acting on the Yellow Fever Expedition of the Liverpool School of Tropical Medicine. The following is a translation of parts of the articles:—"January 18. Drs. Durham and Myers.—Lying at present in the hospital Domingos Freire are the illustrious English doctors who came here in commission on behalf of the Liverpool School of Tropical Medicine to study yellow fever. Daily exposed to infection from the terrible disease, the day before yesterday, after an autopsy at an early hour on a case of very acute form of yellow fever, they began to feel the first symptoms, and without loss of time entered the hospital. A clinical service was arranged, assisted by numerous colleagues of the illustrious men of science, under the direction of their medical assistant. We sincerely hope for the recovery of the distinguished doctors, who through their noble dedication to science have been rendering us such great services, their investigations having already achieved entirely new results from which we may be permitted to look for promising advantages for our country and for humanity at large." "January 22.—In the isolation hospital Domingos Freire succumbed most rapidly and unexpectedly the English bacteriologist Dr. W. Myers, who came to this capital solely for the study of the disease to which he has fallen a victim—yellow fever. Following on a prolonged autopsy, both Dr. Myers and his illustrious companion, Dr. Durham, fell ill themselves, the latter still being under the burden of the disease. Dr. Myers' death took place on the afternoon of the 20th, and the burial was carried out yesterday morning, the coffin being carried from the hospital to the cemetery of Tanta Isabel by Dr. Paes de Carvalho, Governor of the State of Para, and Drs. Francisco Miranda, Americo Campos, Pontes de Carvalho, Gonçalo Lagos and other gentlemen alternately. At the side of the grave the following doctors spoke:—Paes de Carvalho, who showed by the sadness of his expressions the deep grief which he felt, and Americo Campos, as representative of the Medico-Pharmaceutical Society of Para. There were present a large number of members of the English colony, all in deep mourning and visibly affected."

THE neglect of ethnography in Great Britain has often been pointed out in these columns. In his presidential address to the Anthropological Institute on February 4, Mr. C. H. Read showed that not only is our country far behind other nations in respect to provision for teaching the subject, but also in ethnographical collections and accommodation for them. Germany, with colonial possessions infinitesimal in extent compared with those of England, has completely distanced us in this respect; the British Museum collections from British possessions being inferior to those of the Berlin Museum, which has exhibits seven times as numerous as those in the British Museum, and this disproportion is rapidly increasing. After the Benin expedition we allowed ourselves to be outbid in the purchase of specimens, and Mr. Read said that attention has in Germany been officially called to the fact that England seems to be too poor to be able to compete effectively for objects that are indispensable for her ethnographical collections. Most people will agree with Mr. Read that this state of things is a national disgrace, and shows a neglect of scientific interests as astounding to thoughtful minds as it is deplorable. In the matter of ethnographical material, we are apparently becoming renowned as the nation of lost opportunities. Can nothing be done to stimulate national interest in the collection of objects and conservation of knowledge fast disappearing before the advance of civilisation?

MR. VAUGHAN CORNISH, whose name is closely associated with the wave-like forms assumed by drifted materials, is now engaged on the Canadian prairies photographing and studying the forms assumed by drifting snow. Thanks to the liberality of the Canadian Pacific Railway Company and the interest evinced in the investigation by Sir William van Horne, Mr. Cornish writes that his work proceeds satisfactorily, and enough has already been done to justify the expedition.

THE last mail from Japan brings news that Mr. A. Imamura has been nominated assistant professor of seismology at the Imperial University of Tokyo, where he will work with Dr. F. Ōmori at the Seismological Institute. In addition to this Institute, there is in Tokyo a Seismological Investigation Committee, which has already published thirty-two volumes relating to its work, and also, at the Central Meteorological Observatory, a department which receives and analyses the registers relating to earthquakes observed at about one thousand co-operating stations distributed throughout the Empire.

THE next congress of the South-eastern Union of Scientific Societies will be held at Haslemere on June 6–8, under the presidency of Mr. G. A. Boulenger, F.R.S.

THE inaugural meeting of the Birmingham local section of the Institution of Electrical Engineers, which was to have been held on January 23, has now been fixed for Wednesday, February 27, in the University Buildings. Dr. Oliver Lodge, chairman of the section, will deliver an inaugural address, and the president of the Institution, Prof. J. Perry, F.R.S., will be present.

IT is announced in the *British Medical Journal* that an Italian Society of Biology has recently been founded on the initiative of many distinguished naturalists. The first meeting of the society will probably be held in Rome during the coming Eastertide. The object of the society is to promote the study of the biological sciences and everything relating to the advancement and teaching of these. The society will publish a bulletin giving an account of its proceedings.

ON Saturday next, February 23, Lord Rayleigh will deliver the first of a course of six lectures at the Royal Institution on sound and vibrations. On Tuesday, February 26, Dr. Allan Macfadyen will begin a course of five lectures on the cell as the unit of life, and on Thursday, February 28, Prof. Percy Gardner will deliver the first of a course of three lectures on Greek and Roman portrait sculpture. The Friday evening discourse on February 22 will be delivered by Sir William Roberts-Austen, K.C.B. His subject will be "Metals as Fuel."

THE Paris correspondent of the *Chemist and Druggist* states that M. Berthelot, one of the permanent secretaries of the Paris Academy of Sciences, is taking steps to carry out a resolution of that body to distribute annually a gold medal in memory of Lavoisier. M. Paulin Tasset, the engraver, is preparing the die of the medal, and has taken as a model a medallion of the great chemist in profile by David d'Angers. The inscription will be of the simplest nature. The name "Laurent Lavoisier" will appear under the profile, and on the back of the medal the words "Institut de France, Académie des Sciences, Medaille Lavoisier." The medal is likely to become greatly prized by chemists, and will be given for distinguished chemical research. It will be awarded for the first time this year by the Academy of Sciences, and its annual distribution is assured by a balance remaining over from the subscription for the monument, which was unveiled last summer behind the Madeleine Church, Paris.

THE anniversary meeting of the Geological Society was held on Friday, February 15. The officers were appointed as follows:—President: Mr. J. J. H. Teall, F.R.S. Vice-presidents: Mr. J. E. Marr, F.R.S., Mr. H. W. Monckton, Prof. H. G. Seeley, F.R.S. and Mr. W. Whitaker, F.R.S. Secretaries: Mr. R. S. Herries and Prof. W. W. Watts. Foreign Secretary: Sir John Evans, K.C.B., and Treasurer: Dr. W. T. Blanford, F.R.S. The following awards of medals and funds were made:—The Wollaston Medal to Dr. Charles Barrois, of Lille, the Murchison Medal to Mr. A. J. Jukes-Browne, of Torquay, the Lyell Medal to Dr. R. H. Traquair, of Edinburgh, and the Bigsby Medal to Mr. G. W. Lamplugh, of the Geological Survey. The Wollaston Fund to Mr. A. W. Rowe, the Murchison Fund to Mr. T. S. Hall, of Melbourne, and the Lyell Fund to Dr. J. W. Evans and Mr. A. McHenry. The president delivered his anniversary address, which dealt chiefly with the evolution of ideas during the nineteenth century as to the genesis and classification of igneous rocks.

DURING the last fortnight an interesting series of letters on the audibility of the minute-guns at Spithead has appeared in the *Standard*, and several correspondents refer to other instances of the reports of guns being heard at great distances. The firing at Waterloo is said to have been heard at Heathfield (Sussex), as well as at Sandgate, Hythe and Ripple Court (between Dover and Deal), at Sandgate very heavy firing being heard throughout the day to the eastward. Heathfield is about 184 miles from Waterloo, Sandgate 144, Hythe 147 and Ripple Court 135 miles. Accounts are also quoted from Pepys' Diary on the sounds of the battle of Solebay being heard in London (about 100 miles), and, from the *Gentleman's Magazine*, of almost incessant heavy firing from Tournay being audible at Brean, Waltham, Brabourne and on other high lands in Kent (about 110 miles), and from the bombardment of Valenciennes at Dover (about 110 miles).

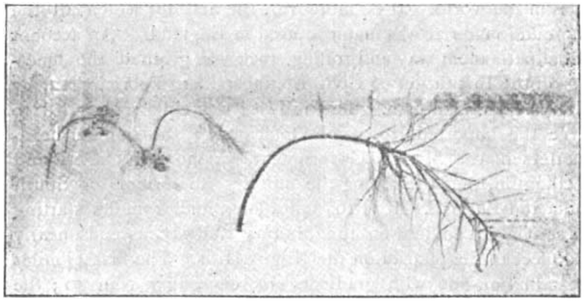
WE have received from Messrs. Lever Bros., Ltd., a translation of a report (which appeared in the *Strassburger Post*) of a lecture on wireless telegraphy, delivered by Prof. Braun at the Institution of Physics of the Emperor William University. Prof. Braun, after giving a short account of the history of the subject, proceeded to describe a system of wireless telegraphy which he had himself worked out. Instead of having a spark gap in the vertical wire, this wire is coiled at its lower end and oscillations are set up in it by induction from another coil containing the spark gap in which the oscillatory discharge takes place. This method, the lecturer claimed, is in many ways superior to that adopted by Marconi, and enables messages to be sent with more certainty and to a greater distance. The results of experiments that had been made were quoted, in which messages were transmitted a distance of about seventy-five miles, using masts ninety feet high at each end. Experiments on the Marconi system are compared with these, in which the results are certainly not so good as those obtained by Prof. Braun. We may, however, call attention to the announcement made by Prof. Fleming to the Liverpool Chamber of Commerce last week (p. 381) that Mr. Marconi had succeeded in transmitting messages a distance of 200 miles, and that messages could be sent simultaneously in both directions, and two or more could be received at once at each station. These results are extremely good, especially as they show that the difficulties of interference of one message with another have been partially, if not wholly, got over. We do not learn from the report of Prof. Braun's lecture whether he has succeeded in avoiding these difficulties in like manner.

THE Government of New South Wales knows how to appreciate scientific information, and use it for the good of the Colony better than some Governments nearer home. A number of excellent pamphlets on the natural resources and industries in New South Wales have been prepared by Mr. T. A. Coghlan, Government Statistician, and distributed by the Agent-General for the Colony. A pamphlet on the timber resources shows that few countries have such a wealth of timber as New South Wales. Its woods are as varied as they are valuable, ranging from the ironbarks, unsurpassed for work requiring hardness and durability, to the kinds suitable for the most delicate specimens of the cabinet-maker's art. Forestry is, however, as yet only in its initial stages in New South Wales, though it is hoped that a School of Forestry will be established in the Colony before long. The importance attached to the diffusion of knowledge of agriculture is evidenced by the existence of a special Department of Agriculture. The central establishment possesses an experimental farm having a total area of 3430 acres, in addition to which there are several other large experimental farms and plantation trial stations. The agricultural position and outlook of the Colony are described in a separate pamphlet. Another pamphlet, on the climate of New South Wales, contains a large map of Europe having upon it the names of towns in the Colony placed beside European towns of corresponding mean temperature. Bourke, for instance, is placed by the side of Messina, Bathurst with Bordeaux, Cooma with Ventnor, and Kiandra with Edinburgh. Two other pamphlets deal respectively with the fauna and the mining industry of New South Wales. The whole series is commendable, and New South Wales is certainly to be congratulated upon the publication of so much valuable information concerning its resources and progress.

THE Nilgiri Railway is notable as being the first Abt-rack railway constructed in India, and, at present, the longest of its class in the world. It is, moreover, the first for which all the plant and material was manufactured in England. An account of the permanent way and rolling stock was given at the meeting of the Institution of Civil Engineers, on February 12, by Mr. W. J. Weightman. The railway was chiefly designed to serve the important towns of Ootacamund, the summer headquarters of the Madras Government, Coonoor, Kotageri and Wellington, the latter being the military sanatorium for South India and Burmah. It is 16¾ miles long, and from its starting point at Mettapollium on the Madras Railway, ascends nearly 5000 feet to the plateau on the Nilgiri Hills. The first 4¾ miles are adhesion-line with gradients not exceeding 1 in 40; the remaining 12 miles are built on the Abt-rack system, and have a ruling gradient of 1 in 12½. The formation-width is everywhere 16 feet, and as the rainfall is frequently 6 inches in as many hours, the greatest possible care has had to be taken to see that it is effectually drained. The locomotives are of the type known as "combined" Abt engines, that is, they can run either on rack or on ordinary line. Before the line was opened for traffic a series of brake experiments was made with a fully loaded train of 100 tons gross weight. With an ascending train at speeds of 6, 8 and 10 miles per hour on a 1 in 12½ gradient, stops were made in 24, 36 and 60 feet respectively; with a descending train at various speeds ranging from 4 to 12 miles per hour, relative stops were made in 54 feet, increasing to 425 feet.

A NUMBER of designs of flying machines have recently appeared in the illustrated papers. The *Graphic* for January 12 contains a figure of a kind of combination of ice boat and flying machine, attributed to an Austrian engineer named Kress. The arrangement of the aerocurves one behind the other would appear, according to Chanute's experiments, to detract from the lifting power of the hind ones. In the *Black and White Budget* for January 26 occurs the figure of a so-called "auto aviator," due to M. Firman Boussan. It is said to be surmounted by a vertical oblong balloon, thus resembling Dr. Danilewsky's balloon, to be provided with curved wings and propellers, and to be provided with wheels by which it can run on the roads. Mr. G. L. O. Davidson's name has also recently figured in several papers in connection with the problem of artificial flight, and illustrations of one of his models appear in the *Scientific American* for February 2. The model in question is a bird-shaped glider, the tail of which has movable parts provided with automatic mechanism for regulating the balance and stability. It appears to have glided satisfactorily, but we do not gather from the journal in question that Mr. Davidson has himself performed glides through the air or experimented with motor-driven models. M. Santos Dumont has been experimenting with a motor-propelled balloon, weighing altogether not more than 250 pounds; but the only performance of which we have read consisted in the maintenance of a relative velocity of seven miles an hour for half a minute.

DURING a severe sleet-storm over a large tract of the northern United States, including Missouri, the water froze as it fell, forming such a heavy coating of ice upon the trees that many of them were bent to the ground by the load, as shown in the accompanying illustration from a paper by Dr. H. von Schrenk, in the *Transactions* of the Academy of Science of St. Louis. The tree in the foreground is a soft maple (*Acer dasycarpum*), likewise the row of trees of which it is one. The trees at the left are birches (*Betula alba*). The tops of the maples scraped on the snow of the street, and is was impossible for one person to lift the top of a tree, much less to restore it to its original position. These trees are good instances of the appearance of the trees all over the affected area; they remained in the bent position until the ice melted a week later, when the maples returned nearly to their original position and the birches stood quite upright as they were before the storm. Dr. Schrenk weighed about two hundred branches, taken from various trees, and he found that the ice-coated branches of the maples were nearly ten times heavier than the same branches without the layer of frozen water upon it. When the branches bore icicles the ratio was much greater, in many cases the weight being about thirty times greater than that of the branches without ice.



DR. E. LEYST has published in the *Bulletin* of the Imperial Society of Naturalists of Moscow an elaborate discussion of the daily range of barometric pressure at that place deduced from hourly observations, and has compared the results with those obtained from earlier observations and with observations made at St. Petersburg. The values of the harmonic analysis coincide generally with those deduced in the laborious discussions of Dr. Buchan and Dr. Hann. One of the important points of the discussion is the conclusion that the daily range at Moscow appears to have undergone a secular change in so far that the extremes of the daily curve occur earlier than was the case some thirty or thirty-five years ago.

THE vitality of certain micro-organisms, both pathogenic and otherwise, in milk under various conditions, forms the subject of an elaborate memoir by Messrs. F. Valagussa and C. Ortona, of the Hygienic Institute of the University of Rome, published in the *Annali d'Igiene Sperimentale*. The action of sunlight on bacteria in milk was investigated, and, as was only to be expected, in consequence of the opacity of the liquid no deleterious effect was detected, except in the case of those varieties which live on the surface of liquids and were, therefore, not shielded from the bactericidal action of sunshine. Another point of interest investigated was the effect of its inoculation into milk upon the elaboration of toxins by the diphtheria bacillus. It was found that although this bacillus does produce toxin when growing in milk, its strength is less than when grown in other culture-media; moreover, a marked increase in the strength of the toxin was noted when the cultivations were kept in a cool cellar instead of at the ordinary temperature of the laboratory. The exact thermal death-point of the tubercle bacillus in milk was also reinvestigated, this being a matter on which many different opinions are held. The authors state that exposure to a temperature of 60°, 70° and 80° C. is insufficient to guarantee the destruction of this bacillus in milk. Milk freshly drawn from the cow, with precautions ensuring its sterility, was found to afford a better culture material for bacteria than after it had been artificially sterilised by heating to 100° C. The paper is rendered of additional value by the very carefully compiled bibliography of the existing literature on the subject which is appended, and which makes it of special use to all interested in this section of dairy-bacteriology.

A PAPER on hermit-crabs allied to *Pagurus bernhardus*, by Mr. J. E. Benedict, is published in vol. xxiii. (pp. 451–466) of the *Proceedings* of the U.S. Museum, and is noteworthy on account of the excellence of the illustrations. Many of the forms described are closely related, but, in the absence of intergradation, they are classed as species rather than races.

Bulletin No. 14 of the Biological Division of the U.S. Department of Agriculture is devoted to a digest of the laws regulating the sale and transport of game in the different States of the union, the authors being Messrs. T. S. Palmer and H. W. Olds. All the States, it appears, are now fully convinced that unless stringent regulations are put in force the game animals and birds of America will ere long disappear for ever. It is satisfactory to learn that every State has now established laws bearing upon the preservation of game, although more general harmony between them might be advantageous. In their preface the authors state that an Act of Congress passed in May last supplements previous laws by prohibiting the shipment from one State to another of birds killed in violation of local laws, and by subjecting birds brought into any State to the regulations affecting native-raised specimens. The need of a compilation epitomising and contrasting the various laws and regulations has been much felt, and this want the present pamphlet endeavours to supply.

THE first three numbers of the new volume of *Die Natur* contain a full report of a lecture delivered in November last before the Verein zur Verbreitung naturwissentschaftlicher Kenntnisse in Vienna, by Prof. F. Toula, on the geological history of the Black Sea. The succession of events, beginning doubtfully in the lower or middle Oligocene, and with certainty in the uppermost Oligocene, is traced through nine distinct stages. The paper forms a most useful summary of recent research over an area including much of the eastern Mediterranean, and extending northward and eastward into Russia and Siberia; a considerable proportion of the work, especially that of Russian geologists and hydrographers, being not easily accessible.

ACCORDING to the *American Museum Journal* for December the search for fossil vertebrate remains in the far West is being prosecuted with as much activity as ever. Fourteen large cases of mammalian remains from the Upper Tertiary of Texas, and several truck-loads of dinosaurian bones from the Jurassic of Wyoming and the Cretaceous of Dakota have reached the Museum as the result of last season's work. The dinosaurian remains include the skeletons of one large carnivorous form and of another more nearly allied to the iguanodon. In the same journal will be found an account of the collections in the geological department of the Museum and the manner in which they were acquired. The first important acquisition was the Holmes collection from the Tertiary of South Carolina; this was followed, in 1875, by the James Hall collection, which at once placed the Museum in the foremost position among American institutions in regard to Palæozoic fossils.

PROF. PENCK contributes a valuable paper to the *Zeitschrift* of the Berlin Gesellschaft für Erdkunde, on the glacial phenomena of Australia. The evidences of glacial action in different parts of Australia during permo-carboniferous times are discussed in detail, and brought into relation with traces of simultaneous action in India and South Africa; and it is shown that, apart from other difficulties, the hypothesis of a shifting of the South Pole to a central point (on the tropic of Capricorn in long. 86° E.) does not satisfactorily account for the geological facts. It is next pointed out that the appearances ascribed to ice action present in each case certain features not characteristic of ordinary glacial deposits—the deposits are stratified, and the pebbles are facetted in the manner first described by Wynne. Further, the Gondwána beds, always closely associated with these boulder deposits, have lately been found in the Argentine Republic. Prof. Penck compares the bedding and facetting with conditions induced by pressure observed in the Nagelfluh and in certain localities near Vienna, and concludes that while many indications certainly point to glacial action, these special points must be fully investigated before the formidable problem of accounting for the existence of glacial conditions over such an enormous area can be attacked. The second part of the paper summarises present knowledge of the quaternary glacial, or glacier, period in Australia and New Zealand, and compares the probable elevation of the snow-line in Australia and western Europe in quaternary and modern times.

MESSRS. J. J. GRIFFIN AND SONS have just introduced a new form of balance which should find a place on many lecture tables. The instrument is large enough to be seen clearly by a large class, and it can be manipulated by the lecturer without standing in front of it. The sensitiveness, rate of swing, length of arm and other characteristics can be altered so as to illustrate the principles of construction of a balance.

A PAPER by Messrs. K. A. Hoffman and E. Strauss on "radioactive lead" appears in the current number of the *Berichte*. This material is extracted from various minerals such as pitchblende, cleveite, broggerite, copperuranite, samarskite and euxenite, and resembles lead in being precipitated from its acid solution by sulphuretted hydrogen, in forming a sulphate insoluble in dilute sulphuric acid, and in having a yellow iodide. It differs from lead in the fact that it acts upon a photographic plate in the dark; it possesses a characteristic violet line in its spark spectrum, and its equivalent is markedly different, being 65·05 as against 51·7 for lead. The authors regard their results as being due to the presence of an element of an atomic weight of over 260, probably either divalent or tetravalent.

IN a recent contribution to the *Proceedings* of the American Academy of Arts and Sciences, Prof. Richards, of Harvard, expresses the opinion that the formal sanction of an international table of atomic weights is only a matter of a short time. The opinion elicited by the Commission of the German Chemical Society is overwhelmingly in favour of $O = 16{\cdot}00$ $(H = 1{\cdot}01)$ as against $H = 1$ $(O = 15{\cdot}88)$, though some eminent authorities would adhere to the old standard. The second question put by the German Commission, as to whether the last figure set down in an atomic weight should be correct to within half a unit, is also answered in the affirmative by a large majority. From this consensus of opinion Prof. Richards is a dissentient, and he explains his position by reference to the case of nitrogen. The International Committee constituted through the German Chemical Society appears already to have made its decision, for in the first number of the *Berichte* for the present year there are inserted two tables of atomic weights, one of which is headed "Internationale Atomgewichte." In this the basis is $O = 16{\cdot}00(H = 1{\cdot}008)$, and the numbers given are accurate to one unit in the last place. The second table issued with the *Berichte* is of "Didaktische Atomgewichte" to the basis $H = 1{\cdot}00(O = 15{\cdot}88)$. It is obviously intended to meet the objections of teachers who foresaw difficulties in having to explain the use of 16 as the basis of a numerical system for atomic weights and densities. Opinions will differ as to the wisdom of having two tables current, but in any case they need not both be adopted by the same person. It would be hard for a teacher to have to remember that in the class-room S was 31·83, whilst in the laboratory it was 32·06. It is probable that most didactic requirements will be satisfied with $S = 32$.

THE additions to the Zoological Society's Gardens during the past week include a Common Guinea Fowl (*Numida meleagris*) from Morocco, presented by Mr. G. E. Veroutsos; fourteen Tree Frogs (*Hyla*, sp. inc.) from Barbadoes, a Capuchin (*Cebus*, sp. inc.) from South America, a Black-handed Spider Monkey (*Ateles geoffroyi*) from Central America, two Blood-rumped Parrakeets (*Psephotus hoematonotus*) from Australia, deposited; an August Amazon (*Chrysotis augusta*) from Dominica, four Banded Grass Finches (*Poëphila cincta*) from Queensland, two Arizona Heloderms (*Heloderma suspectum*) from Arizona, U.S.A., purchased.

OUR ASTRONOMICAL COLUMN.

REDUCTION OF OBSERVATIONS OF EROS.—In anticipation of the conclusion of the work on the planet Eros during the recent opposition, Prof. G. C. Comstock, of Washburn Observatory, U.S.A., contributes a note to the *Astronomical Journal*, No. 490, on the limits available in the necessary reductions. The question of reducing micrometer measures depends on the degree of accuracy with which it may be assumed that the mean of a number of settings represents the positions of the planet and comparison stars at the mean of the observed times. The problem is discussed with respect to three independent sources of changes in the observed coordinates.

(*a*) *Geocentric motion.*—General result is that if a set of measures does not extend over a period greater than one hour, the planet's motion may be treated as uniform, with a probable error of $\pm 0''{\cdot}01$.

(*b*) *Parallax*, which changes with the observer owing to the diurnal motion. In this case the interval allowable is less than half an hour.

(*c*) *Differential refraction*, varying with the time of observation. For this element a table is given showing the correction introduced for varying zenith-distances.

CONSTANT OF ABERRATION.—The results of zenith-telescope observations of latitude at the Flower Observatory, University of Pennsylvania, are given by Mr. C. L. Doolittle in the *Astronomical Journal* (No. 490).

The correction to Struve's aberration constant was determined from these observations and applied to the final reductions. The following values of the constant have hitherto been derived:—

1892–1893	20″·552	at Bethlehem.
1894–1895	20·537	,, ,,
1896–1898	20·580	,, Philadelphia.
1898–1900	20·542	,, ,,